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ISO 14001 AND EMAS

- New Possibilities for the Industry

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ITT FLYGT AB

ITT Flygt AB is a division of ITT Fluid Technology Corporation (ITT FTC). ITT FTC is a business unit of ITT Industries, a leading diversified manufacturing company. ITT Flygt AB employs 3,700 people world-wide and had a 1996 turnover of approx. USD 630 millions. The ITT Flygt main manufacturing plant in Sweden is certified according to ISO 9001, ISO 14001 and registered according to EMAS.

With 36 fully- and partly owned subsidiaries situated around the world from the United States to China, and with agents and distributors in approx. 120 countries, ITT Flygt is the world's leading manufacturer and supplier of water management and submersible pumping technology.

The ITT Flygt Group's customer base varies widely, but is largely drawn from the public service sector and companies involved in water supply, waste water handling and environmental control. Mining, construction, pulp- and paper, power generation, engineering and food industries are also important customers for the company's world-beating fluid handling and water and waste water treatment technology. Therefore ITT Flygt continue to place great emphasis on investment in research and design in order to meet their customer's need more efficiently, and help them solve their problems in water handling.

ITT FLYGT AB IS A PROACTIVE COMPANY

What does proactive really mean? The definition according to ITT Flygt AB is to;

- take the initiative - be in the forefront,
- go furter than laws and regulations request,
- be open towards authorities and the society,
- prevent "problems to arise before they appear",
- work both with "top-down" and "bottom-up" strategies, and
- use environmental progress as a marketing tool.

WHAT IS AN ENVIRONMENTAL MANAGEMENT SYSTEM?

An Environmental Management System, abbreviated EMS, is a system designed to structure work on environmental studies and audits, assess environmental effects, establish environmental goals and ensure that the company and/or organisation meets current and future legislation requirements and policies.

A typical model for an EMS has usually the following parts;

- Environmental policy
- Planning
- Implementation and operation
- Checking and corrective actions
- Management review

These five chapters are linked to each other and create a loop, that will stimulate for a continuous improvement. The "continuous improvement" is the important key word for EMS, and also the incentive for doing things the right way and stimulate management and employees to take the correct actions.

THE EMS MODEL

The key word for an environmental management system is "continuos improvement". The five parts of the environmental management system also described above, are than linked to each other and with the "continuos improvement" - concept like the figure below;
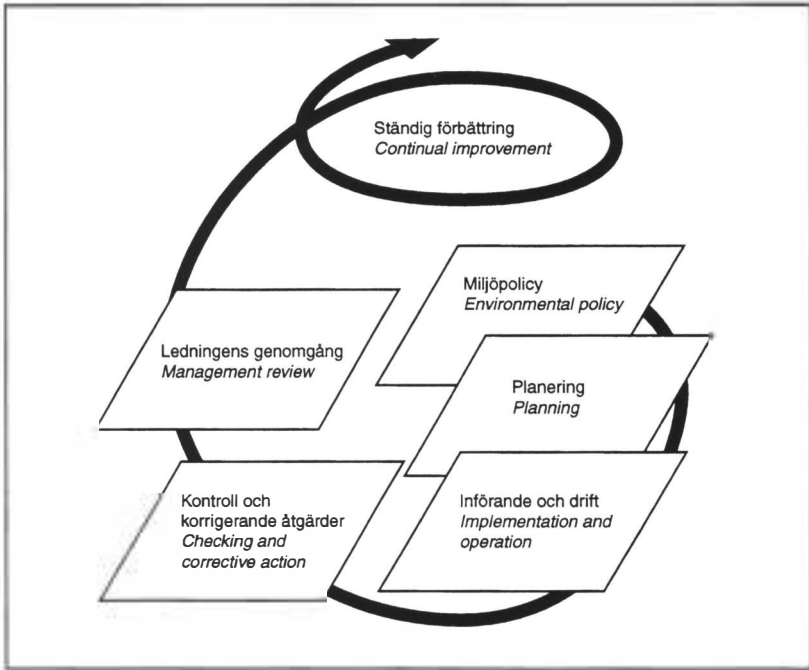
There are two standards available; ISO 14001 and EMAS.

WHAT IS ISO 14001?

ISO 14001 is an international standard for EMS. The EMS can be integrated with other management requirements to help companies and/or organisations achieve both environmental and financial targets. The standard can be applied to all companies and/or organisations, irrespective of how large they are and what they do. It also takes account to different geographical, cultural and social conditions.

ISO 14001 is actually only a part of a big ISO 14000-family. ISO 14000 is like ISO 9000, except that it is not a company's product quality and services which are being formalised. ISO 14000 focuses on resource-saving and environmental adjustment for lasting development through the use of raw materials, manufacturing processes, product design and recycling. Both these standards demand a management policy, the distribution of authority and responsibility, the establishment of local routines and periodic follow-up of the work. The only other point of difference is that ISO 14000 more clearly acts as a guarantee of constant improvement within a company.

As environmental awareness becomes more important in daily life, there is increasing need for such standard. Environmental legislation is increasing world-

wide, and will become more stringent. Laws now cover a wide range of aspects including emissions to air, liquid effluent, solid waste, noise, dust and storage. So a proactive approach, which ISO 14000 encourages, is both a good practise and reduces the risk of legal action against a company.

More than this, though, it can provide a competitive advantage. Good environmental management can pinpoint opportunities for cost savings. It encourages energy efficiencies and reduces waste. It gives you a nice, clean corporate image. In short, it is good for your bottom line. Particularly as insurance companies are getting tougher on companies with poor environmental records.

The different standards within ISO 14000 are like a toolbox, providing all the necessary strategic tools for daily environmental work. The different standards within the ISO 14000-family are;

ISO 14000   General guidelines on principles, systems and
                            supporting technologies.

ISO 14001   Specification with guidance for use.

ISO 14010-12   Environmental auditing.

ISO 14020-25   Environmental labelling.

ISO 14031   Environmental performance evaluation.

ISO 14041-43   Life Cycle Assessment

ISO 14050   Terms and definitions.

ISO 14001 is a voluntary system and the first standards within the "family" was signed in August 1996.

WHAT IS EMAS?

EMAS, the Eco-Management and Audit Scheme, is a European Community initiative, which was implemented by Council Regulation (EEC) No. 1836/93 of 29th June 1993. It is similar in its scope to the ISO 14000 standards, though more targeted toward industry. It is entirely voluntary, like ISO 14000, yet for companies participating in the scheme there is a strict emphasis on the preparation of a publicly available environmental review, and independent auditing.

The initial EMAS work started already in 1989, within the fifth EU action programme, named "Towards Sustainability". EU found that to reach this goal it will not be enough with laws and regulations, but a must for a voluntary responsibility and participation from the industry. Later it has been found out that also sectors like agriculture, forestry, energy production, transports and municipal sewage water treatment, must be included in the process.

EMAS requires an environmental policy and management systems to be drawn up to suit the individual company, its site and its circumstances. A structured programme needs to be put in place with clearly defined goals and objectives. All appropriate staff, especially top management, must be involved and committed to the programme, and charged with implementing it. The programme's

progress must be audited at regular intervals. Finally, companies must issue a public statement setting out how well they are matching up to their stated objectives. Subsequent statements will need to report progress against these objectives.

Registration for EMAS is by site, not by company. Before working toward any improvement of the company's impact on the environment, a formalised environmental policy for the company needs to be drawn up. The next step is to review the site, identify all its environmental impacts. This has to be assessed against the company's stated policy and environmental regulations. Following this, specific targets must be set and priority areas identified. Once priorities have been set, the environmental programme has to be implemented in a properly organised and documented way, with fully trained personnel responsible for it at all levels. Auditing should be at regular intervals, and must be objective, systematic and fully documented.

WHY DO WE NEED EMS, ISO 14001 AND EMAS?

The answer on this question has partly been answered above, but it can be summarised in the following six points;

- For the sake of the environment.
- For our employees.
- To give structure to our own environmental efforts.
- For the future competitiveness.
- For shareholders
  - Sound environmental performance will be of interest to existing and potential shareholders.
- For banks and insurance companies
  - Sound environmental performance will improve the terms under which we co-operate with banks and insurance companies.

DO WE NEED BOTH ISO 14001 AND EMAS?

ISO 14001 and EMAS are designed to complement each other, and represent a significant step forward in improving and formalising environmental management systems. This means that it is not a question of ISO 14001 or EMAS;

- they are not competing with each other,
- they are complementing each other.

It is logic to start with ISO 14001, since this standard is designed and approved for the international market. EMAS is interesting, and for the moment, only relevant for the European market.

THE ITT FLYGT ESH MANUAL

The manual developed for ITT Flygt AB is not restricted to the environmental aspects only. Also the safety and health aspects are taken into account. The table of content for the ITT Flygt AB manual is as follows;

    Introduction

1. Scope
2. Normative references
3. Definitions
4. Management system for the environment
5. Management system for safety
6. Management system for health

For the moment it is only the management system for the environment that can be audited and certified by an external, approved certification organisation. However, it is a belief that also the management systems for safety and health can be audited and certified within some years. There is no international standard agreed upon for the management systems for safety and health, even if some certification organisations have developed their own models for these systems.

THE ITT FLYGT EMS - CHAPTER 4. MANAGEMENT SYSTEM FOR THE ENVIRONMENT

ITT Flygt AB has used exactly the same table of content (chapters) for the environmental management system as described in the ISO 14001 standard;

4.1. General requirements
4.2. Environmental policy
4.3. Planning
4.4. Implementation and operation
4.5. Checking and corrective actions
4.6. Management review

The chapters 4.2-4.6 are the ones this is a part of the continuos improvement process. In chapter 4.1. General requirements it is just stated that the organisation shall establish and maintain an environmental management system, the requirements of which are described in the whole of chapter 4. Management system for the environment.

Regarding chapter 4.2. Environmental policy it is noted that the top management of the organisation shall define the environmental policy and ensure that it

- is appropriate to the nature, scale and environmental impacts of its activities, products or services;
- includes a commitment to continual improvement and prevention of pollution;

- includes a commitment to comply with relevant environmental legislation and regulations and with other requirements to which the organisation subscribes;
- provides the framework for setting and reviewing environmental objectives and targets;
- is documented, implemented and maintained and communicated to all employees; and
- is available to the public.

The text below, describing the content of the chapters 4.3-4.5 Planning, Implementation and operation, and Checking and corrective action, are taken word by word from the ISO 14001 standard (Svensk Standard SS-EN ISO 14001).

4.3. PLANNING

This chapter is divided into four parts;

Environmental aspects

The definition of environmental aspects is "element of an organisation´s activities, products or services that can interact with the environment".

The organisation shall establish an maintain procedures to identify the environmental aspects of its activities, products or services that it can be expected to have an influence, in order to determine those which have or can have significant impacts on the environment. The organisation shall ensure that the aspects related to these significant impacts are considered in setting its environmental objectives.

The organisation shall keep this information up-to-date.

Legal and other requirements

The organisation shall establish and maintain a procedure to identify and have access to legal and other requirements to which the organisation subscribes, that are applicable to the environmental aspects of its activities, products or services.

Objectives and targets

The organisation shall establish and maintain documented environmental objectives and targets, at each relevant function and level within the organisation.

When establishing and reviewing its objectives, an organisation shall consider the legal and other requirements, its significant environmental aspects, its technological options and its financial, operational and business requirements, and the views of interested parties.

The objectives and targets shall be consistent with the environmental policy, including the commitment to prevention of pollution.

Environmental management programmes

The organisation shall establish and maintain programmes for achieving its objectives and targets. It shall include;

- designation of responsibility for achieving objectives and targets at each relevant function and level of the organisation;

- the means and time-frame by which they are to be achieved.

If a project relates to new developments and new or modified activities, products or services, programmes shall be amended where relevant to ensure that environmental management applies to such projects.

4.4. IMPLEMENTATION AND OPERATION

This chapter is divided into seven parts;

Structure and responsibility

Roles, responsibilities and authorities shall be defined, documented and communicated in order to facilitate effective environmental management.

Management shall provide resources essential to the implementation and control of the environmental management system. Resources include human resources and specialised skills, technology and financial resources.

The organisation's top management shall appoint specific management representatives who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority for;

-ensuring that environmental management system requirements are established, implemented and maintained in accordance with this International Standard;

- reporting on the performance of the environmental management system top management for review and as a basis for improvement of the environmental management system.

Training, awareness and competence

The organisation shall identify training needs. It shall require that all personnel whose work may create a significant impact upon the environment, have received appropriate training.

It shall establish and maintain procedures to make its employees or members at each relevant function and level aware of;

- the importance of conformance with the environmental policy and procedures and with the requirements of the environmental management system;

- the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance;

- their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements;

- the potential consequences of departure from specific operating procedures.

Personnel performing the tasks which can cause significant environmental impacts shall be competent on the basis of appropriate education, training and/or experience.

Communication

With regard to its environmental aspects and environmental management system, the organisation shall establish and maintain procedures for;

- internal communication between the various levels and function of theorganisation; and

- receiving, documenting and responding to relevant communication from external interested parties.

The organisation shall consider processes for external communication on its significant environmental aspects and record its decision.

Environmental management system documentation

The organisation shall establish and maintain information, in paper or electronic form, to;

- describe the core elements of the management system and their interations; and

- provide direction to related documentation.

Document control

The organisation shall establish and maintain procedures for controlling all documents required by the International Standard to ensure that;

- they can be located;

- they are periodically reviewed, revised as necessary and approved for adequacy by authorised personnel;

- the current versions of relevant documents are available at all locations where operations essential to the effective functioning of the environmental management system are performed;

- obsolete documents are promptly removed from all points of issue and points of use or otherwise assured against unintended use;

- any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified.

Documentation shall be legible, dated and readily identifiable, maintained in an orderly manner and retained for a specified period. Procedures and re-

sponsibilities shall be established and maintained concerning the creation and modification of the various types of documents

Operational control

The organisation shall identify those operations and activities that are associated with the identified significant environmental aspects in line with its policy, objectives and targets. The organisation shall plan these activities, including maintenance, in order to ensure that they are carried out under specified conditions by;

- establishing and maintaining documented procedures to cover situations where their absence could lead to deviations from the environmental policy and the objectives and targets;

- stipulating operating criteria in the procedures;

- establishing and maintaining procedures related to the identifiable significant environmental aspects of goods and services used by the organisation and communicating relevant procedures and requirements to suppliers and contractors.

Emergency preparedness and response

The organisation shall establish and maintain procedures to identify potential for and respond to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them.

The organisation shall review and revise, where necessary, its emergency preparedness and response procedures, in particular, after the occurance of accidents or emergency situations.

The organisation shall also periodically test such procedures where practicable.

4.5. CHECKING AND CORRECTIVE ACTIONS

This chapter is divided into four parts;

Monitoring and measurement

The organisation shall establish and maintain documented procedures to monitor and measure, on a regular basis, the key characteristics of its operations and activities that can have significant impact on the environment. This shall include the recording of information to track performance, relevant operational controls and conformance with the organisation´s objectives and targets.

Monitoring equipment shall be calibrated and maintained and records of this process shall be retained according to the organisation's procedures.

The organisation shall establish and maintain a documented procedure for periodically evaluating compliance with relevant environmental legislation and regulations.

Non-conformance and corrective and preventive actions

The organisation shall establish and maintain procedures for defining responsibility and authority for handling and investigating nonconformance, taking action to mitigate any impacts caused and for initiating and completing corrective and preventive action.

Any corrective or preventive action taken to eliminate the causes of actual and potential nonconformances shall be appropriate to the magnitude of problems and commensurate with the environmental impact encountered

The organisation shall implement and record any changes in the documented procedures resulting from corrective and preventive action.

Records

The organisation shall establish and maintain procedures for the identification, maintenance and disposition of environmental records. These records shall include training records and the results of audits and reviews.

Environmental records shall be legible, identifiable and traceable to the activity, product or service involved. Environmental records shall be stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. Their retention times shall be established and recorded.

Records shall be maintained, as appropriate to the system and to the organisation, to demonstrate conformance to the requirements of this International Standard.

Environmental management system audit

The organisation shall establish and maintain programmes and procedures for periodic environmental management system audits to be carried out, in order to;

- determine whether or not the environmental management system

  1) conforms to planned arrangements for environmental management including the requirements of this International Standards; and

  2) has been properly implemented and maintained; and

- provide information on the results of audits to management.

The organisation's audit programme, including any schedule, shall be based on the environmental importance of the activity concerned and the results of previous audits. In order to be comprehensive, the audit procedures shall

cover the audit scope, frequency and methodologies,as well as the responsibilities and requirements for conducting audits and reporting results.

4.6. THE MANAGEMENT REVIEW

The organisation's top management shall, at intervals it determines, review the environmental management system, to ensure its continuing suitability, adequacy, and effectiveness. The management review process shall ensure that the necessary information is collected to allow management to carry out this evaluation. This review shall be documented.

The management review shall address the possible need for changes to policy, objectives and other elements of the environmental management system, in light of environmental management system audit results, changing circumstances and the commitment to continual improvement.

HOW DO WE GET APPROVED FOR ISO 14001 AND EMAS?

There are probably many different ways and strategies for making the necessary preparations to be ready for a certification organisation to audit the environmental management system developed at a company, and how well the system is implemented by the personnel.

The following approach was used by ITT Flygt's factory in Lindås, Emmaboda, Sweden;

- Conduct an ESH Project
  - internal personnel preferable, with external consultancy if necessary.
- Identify suitable working groups, e.g.
  - air and water management
  - waste management
  - health management
  - safety management
  - industrial hygiene
  - fire and emergency
  - chemicals
  - training
- Implement the management system
- Educate and train all the personnel
- Select a certification/verification organisation
- Conduct a pre-audit
- Correct findings
- Conduct the main audit
- Correct findings
- Approval for ISO 14001 and EMAS

HOW DO WE USE ISO 14001 AND EMAS?

Both ISO 14001 and EMAS are dynamic tools for the organisation, with the purpose to obtain continous improvement. This means that the environmental management system must continuously be updated, revised and checked. Since it is the whole organisation that is involved in the system, a continous implementation must be conducted. All personnel must be involved, not only different parts of the organisation.

By monitoring, evaluating and updating all the environmental aspects and goals, you can guarantee for a system that is dynamic, and continuously improving. It is also important to check that the personnel is conscious and participating in the process of updating aspects and goals.

The environmental policy must regularly be evaluated and updated. When improvement is obtained, the policy must be strengthened.

WHAT COMES AFTER ISO 14001 AND EMAS?

We look upon ISO 14001 and EMAS with a holistic approach. This means that we do not isolate the environment from the other three topics; Safety, Health and Quality. However, we have not yet integrated the four topics into one system. The goal for the future is to work with one system that takes all the topics into account.

Another task for the future is to implement some of the other standards of the ISO 14000-family into the daily work;

- environmental auditing,
- environmental labelling,
- environmental performance evaluation, and
- Life Cycle Assessment (LCA).

Two other aspects that must be taken into consideration in the future are;

- product liability and
- production liability.

MULTI-PURPOSE EFFECTS

The positive effects of implementing EMS, and get certified for ISO 14001 and verified for EMAS, have already partly been described above, but additional multi-purpose effects can be added to the list;

- Effective routines on how to organise the environmental work.
- Working methods for purchasing and product development.
- A system for control and revision of the environmental work.
- A system for evaluating and reporting the environmental work.
- The product's effect on the environment.

- Improving safety aspects at the working places.
- Improving health conditions of the employees.
- Good environmental performance is marketing.
- Improving competitiveness.

This list is not a complete list, but it can be regarded to be enough incentives for the industry to work active with environmental issues, and to be proactive, not only with the environmental aspects, but also with working environment related questions.

REFERENCES

SS-EN ISO 14001. Environmental management systems - Specification with guidance for use (ISO 14001:1996). Standardiseringen i Sverige (SIS).

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